

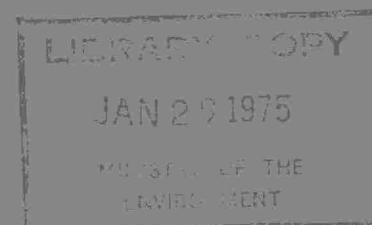
OPERATING SUMMARY

TD227
F73
W38
1973
MOE

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FRANKFORD

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FRANKFORD
WATER POLLUTION CONTROL PLANT
and
WATER SUPPLY SYSTEM

Operated on behalf of the

VILLAGE OF FRANKFORD

by the
MINISTRY OF THE ENVIRONMENT

1973 ANNUAL OPERATING SUMMARY

TD
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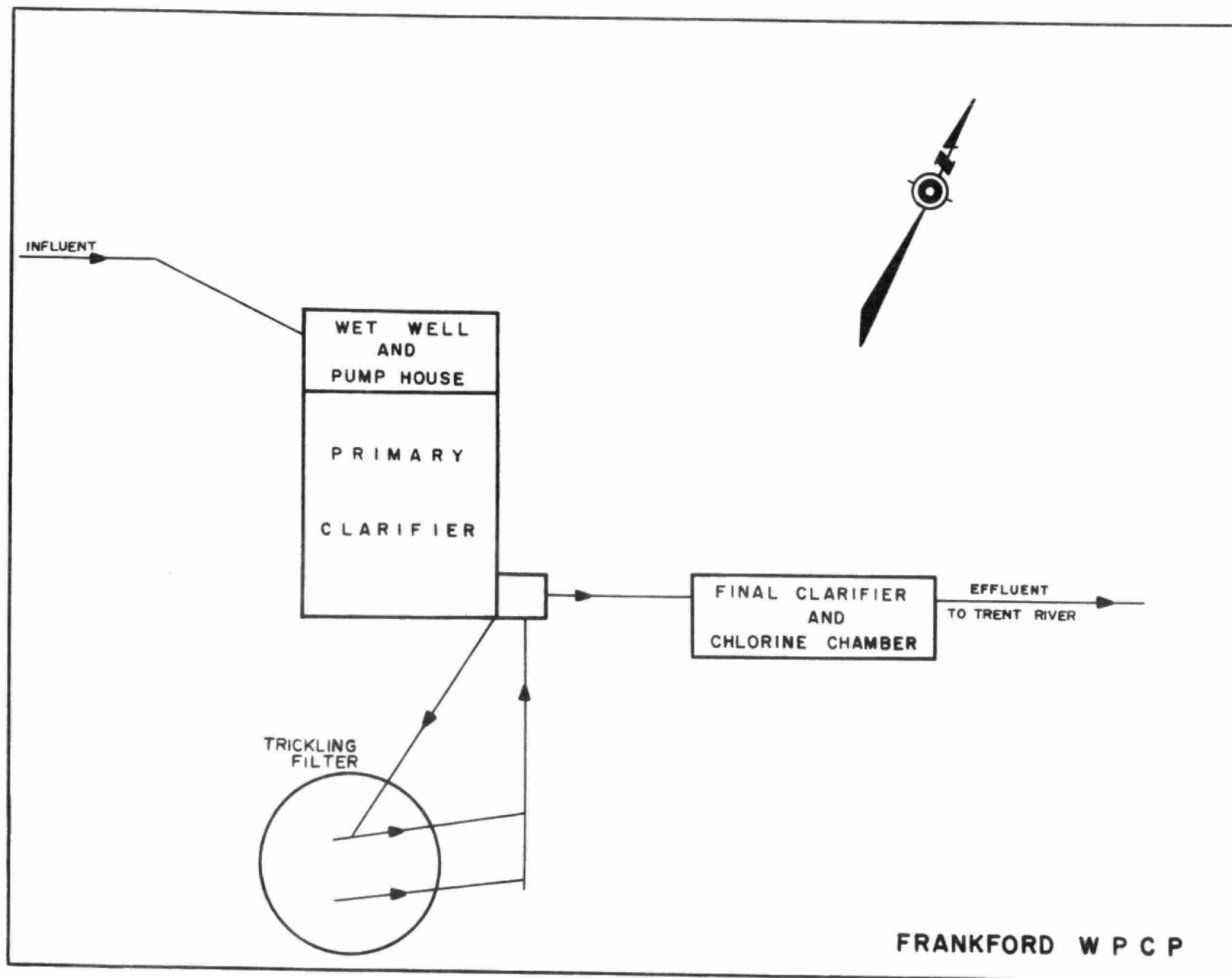
WATER POLLUTION CONTROL PLANT

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WATER SUPPLY SYSTEM

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WATER POLLUTION CONTROL PLANT



DESIGN DATA

PROJECT NO. 2-0009-57

TREATMENT Trickling Filter

DESIGN FLOW -

Primary 0.54 mgd
Secondary 0.12 mgd

SEWAGE PUMPING STATION

Pumps

1 electric, 0.54 mgd @ 20' tdh
1 gasoline standby 0.54 mgd @ 20' tdh

PRIMARY TREATMENT

Coarse bar screen @ 1" centres

Grit Removal

Type: Manually-cleaned channels
Size: Two 9' x 2' x 1' water depth
@ 0.54 mgd
Flow velocity: 0.5 ft/sec

Primary Sedimentation

Size: One 60' x 16' 6" x 7' 5"
(46,500 gal)
Retention: 2 hr @ 0.54 mgd
Loading: Surface, 565 gpd/ft²
Weir, 33,800 gpd/ft

SECONDARY TREATMENT

Type: Trickling filter
Size: One 42' dia x 4' depth

Recirculation: 3.1 through primary
Loading: 1.5 lb BOD/yd³/day

SECONDARY SEDIMENTATION AND CHLORINATION

Type: Earth-banked pond
Size: One 16' x 40' x 3'
Retention: 2 hr @ 0.12 mgd

'73 Review

GENERAL

Operation of the Frankford Water Pollution Control Plant (WPCP) was turned over to the Trenton WPCP staff on June 6, 1972.

During the remainder of 1972 only minor mechanical repairs at the plant and pumping station were required. All of the upper floors and equipment at the plant were painted. Seven sewer blockages occurred which had to be rodded and flushed and the entire sewer system was flushed in the fall of the year.

In 1973 an alarm system was installed tying the plant into the Trenton WPCP and the homes of three staff members. The chlorinator, #1 sewage pump at the pumping station, and the motor on #1 sewage pump at the plant were overhauled. A new clutch was installed on the standby engine. In December of 1973 alum feeding equipment was installed at the plant for phosphorus removal.

In the sewer system ten blockages were cleared and new sewer rodding equipment purchased. The sewers on Victoria, Scott and King Streets were inspected by television camera and cleared of rocks and gravel. The sewer system was inspected and flushed as required spring and fall. The plant staff raised 24 manholes in preparation for paving of the street.

EXPENDITURES

The 1973 operating costs were \$17,291.81, well above the budgeted amount of \$11,015.00. The extra operating costs resulted from overhauling of the chlorinator, pumps and motors at the plant.

PLANT PERFORMANCE AND TREATMENT DATA

Flows for the year totalled 71.9 million gallons. The average daily flow was 200,000 gallons, relatively unchanged from 1972.

The sewage BOD was reduced by 39 per cent from an influent concentration averaging 87 mg/l to an effluent concentration of 53 mg/l. The sewage suspended solids was reduced by 63 per cent from an influent concentration of 100 mg/l to an effluent concentration of 37 mg/l. Phosphorus concentrations averaged 4.5 mg/l in the plant influent and 3.7 mg/l in the effluent.

Haulage of raw sludge totalled 140,000 gallons. A total of 208 cubic feet of grit was removed from the plant. The plant effluent was disinfected with a total of 2,341 pounds of chlorine.

PLANT LOADING

The plant was heavily overloaded with flows averaging 167 per cent of design capacity. Over the past few years, flows have gradually increased from a total of 64 million gallons in 1968 to nearly 72 million gallons in 1973. During this same period there has been a general drop in the BOD and suspended solids concentration, resulting in no increase in BOD or suspended solids loading to the plant. This trend indicates an increase in infiltration into the sewer system.

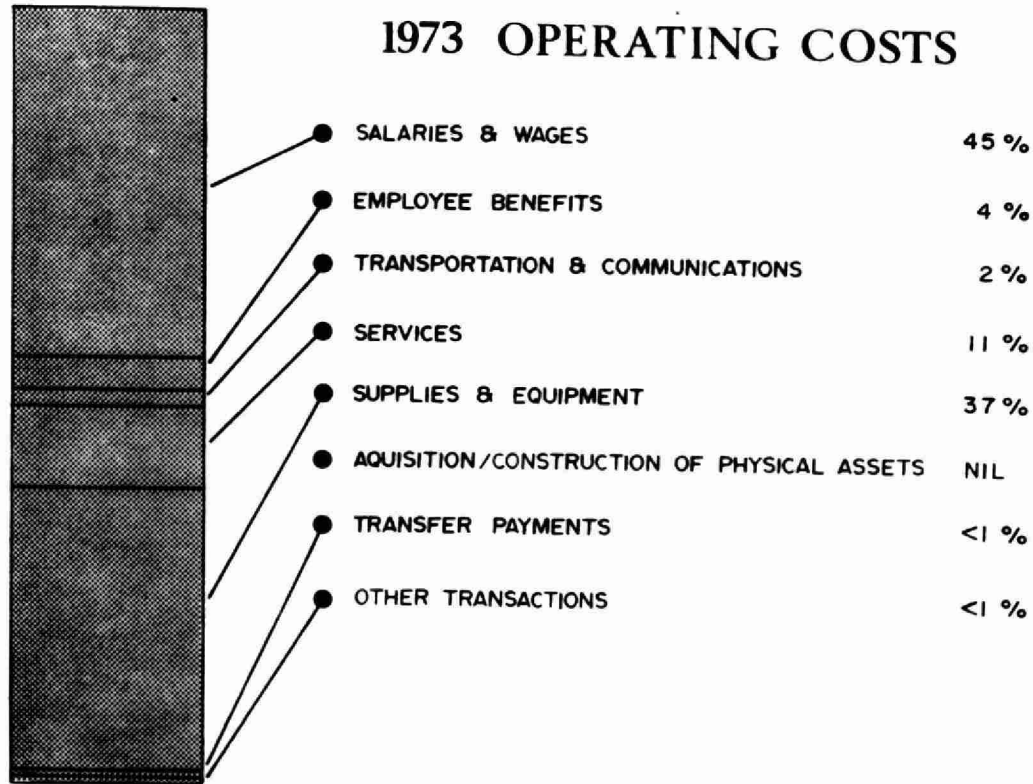
CONCLUSIONS

The plant is operating satisfactorily, considering the hydraulic overloading which it is experiencing. Repairs to the sewer system scheduled for 1974 should reduce the infiltration. Expansion of the sewer system and the water pollution control plant scheduled for 1974 will improve the quality of the effluent dramatically.

The staff have completed a considerable amount of maintenance work and improvements to the project and are to be commended for their efforts.

ANNUAL COSTS

1973 OPERATING COSTS



YEARLY OPERATING COSTS

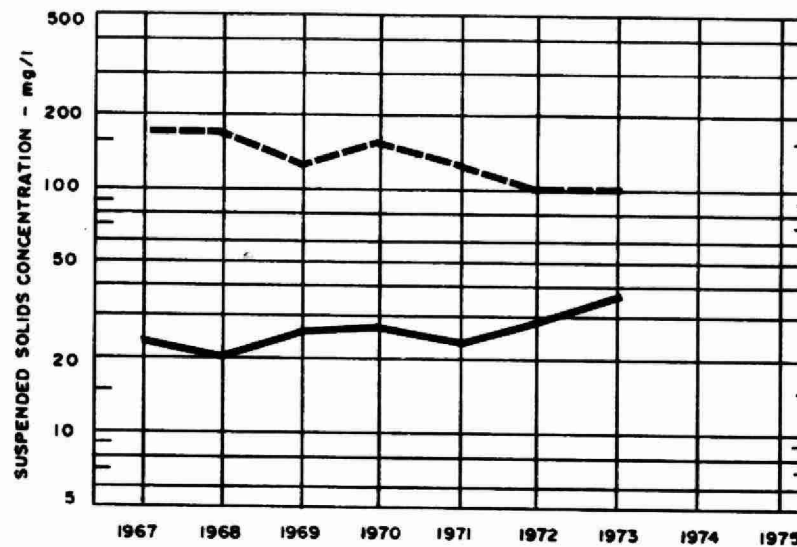
YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	UNIT COSTS	
			\$/M.G.	¢/lb BOD
1968	64	\$ 6,802.	100	
1969	50	9,195.	183	
1970		9,116.		
1971		9,271.		
1972		10,420.		
1973		17,292		

OPERATING EXPENDITURES

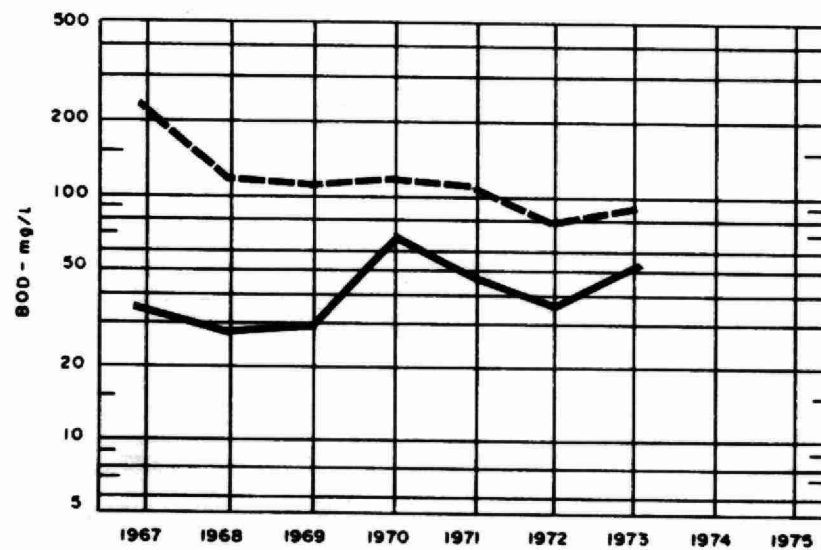
SALARIES AND WAGES	<u>\$ 7829</u>
EMPLOYEE BENEFITS	<u>653</u>
TRANSPORTATION & COMMUNICATIONS	<u>375</u>
SERVICES	<u>1823</u>
SUPPLIES AND EQUIPMENT	<u>6369</u>
ACQUISITION/CONSTRUCTION OF PHYSICAL ASSETS	<u>0</u>
TRANSFER PAYMENTS	<u>123</u>
OTHER TRANSACTIONS	<u>119</u>
TOTAL	<u>\$ 17292</u>

PROCESS DATA

SUSPENDED SOLIDS VARIATION



BIOCHEMICAL OXYGEN DEMAND VARIATION



PLANT INFLUENT - - - - -

PLANT EFFLUENT —————

PLANT PERFORMANCE

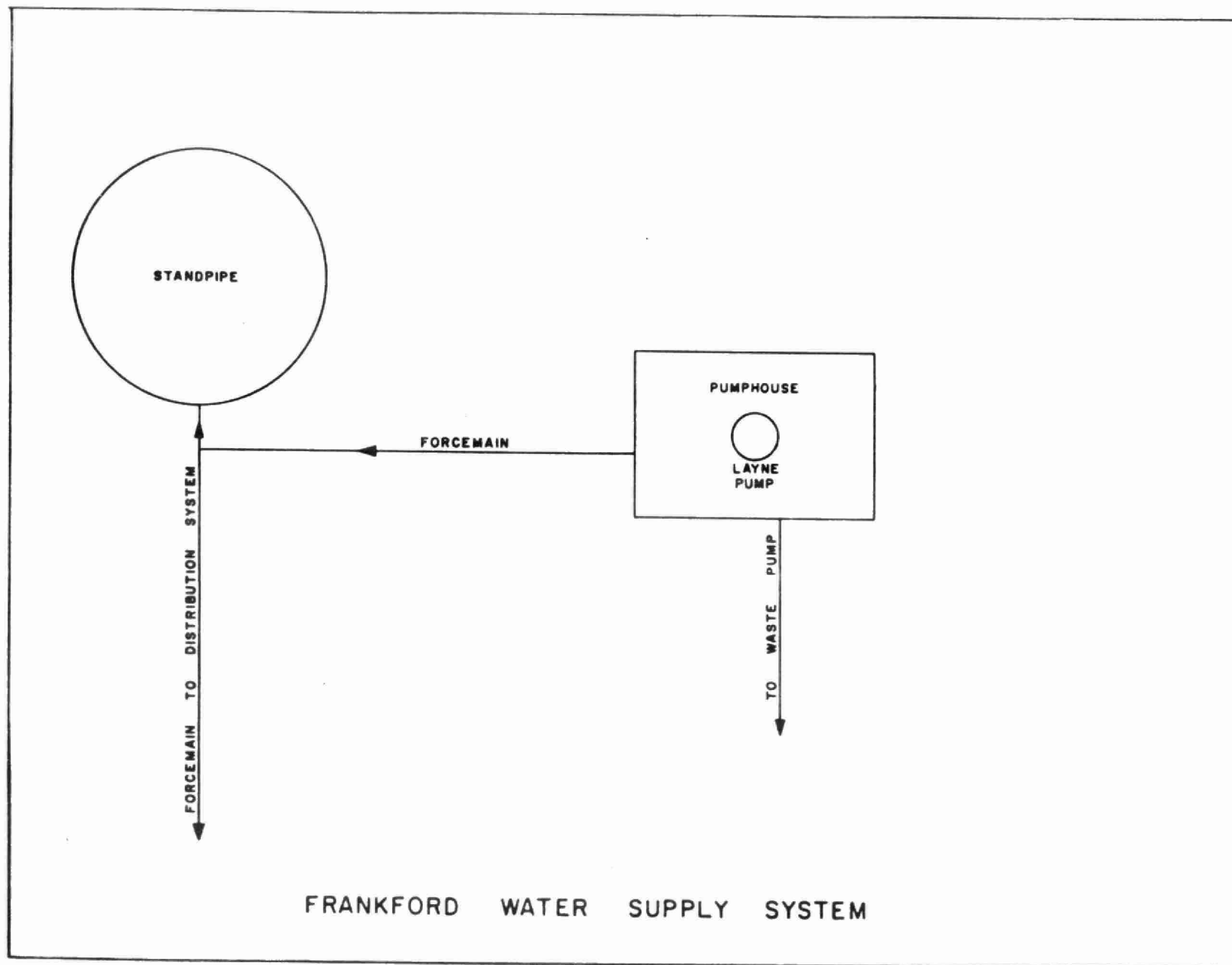
MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT
	million gallons	mil. gal	mgd	mg/l	mg/l	%	10 ³ pounds	mg/l	mg/l	%	10 ³ pounds	mg/l P	mg/l P
JAN	8.64	0.28	0.39	72	61	15		65	30	54		3.4	2.6
FEB	6.70	0.24	0.40	67	48	28		65	35	46		3.5	3.2
MAR	9.70	0.31	0.43	44	22	50		80	20	75		4.5	2.5
APR	8.46	0.28	0.44	47	34	28		52	35	33		1.7	2.1
MAY	6.01	0.19	0.39	59	31	47		97	28	71		3.7	2.7
JUNE	4.50	0.15	0.20	62	46	26		110	35	67		5.1	4.3
JULY	3.69	0.12	0.20	120	80	30		140	45	68		5.5	4.0
AUG	3.72	0.12	0.30										
SEPT	2.98	0.10	0.15	97	45	54		120	45	75		7.5	6.0
OCT	4.74	0.15	0.29	120	56	52		110	45	69		6.9	5.3
NOV	6.53	0.22	0.30	100	86	15		120	38	69		3.3	3.4
DEC	6.20	0.20	0.30	120	47	60		72	40	44		3.1	3.5
TOTAL	71.87 *	-	-	-	-	-		-	-	-		-	-
AVG.		0.20	MAXIMUM 0.44	87	53	39		100	37	63		4.5	3.7
No. of Samples	-	-	-	29	20	-	-	29	20	-	-	29	20

* Note: Flow shown does not represent inflow to treatment plant, as recirculation during fall and winter months passes through flow meter.

TREATMENT DATA

MONTH	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
	QUANTITY REMOVED cubic feet	CL ₂ USED pounds	AVG. DOSE mg/l	BOD mg/l	SUSPENDED SOLIDS mg/l	MLSS CONC mg/l	F/M day ⁻¹	AIR 1000 ft ³ lb BOD	RAW SLUDGE			DIGESTED SLUDGE			SUPER- NATANT T. S. %	AMOUNT HAULED cubic yards
									QUANTITY 10 ³ gallons	TOTAL SOLIDS %	VOL. SOLIDS %	QUANTITY 10 ³ gallons	TOTAL SOLIDS %	VOL. SOLIDS %		
JAN	16	203	2.3	34	30				10.0							60
FEB	16	149	2.2	40	30				9.0							54
MAR	16	209	2.2	34	30				4.5							27
APR	20	208	2.5	17	30				9.0							54
MAY	16	172	2.8	33	25				15.0	1.5						89
JUNE	16	159	4.5	47	50				10.0	5.2						60
JULY	20	213	5.8	80	55				22.5	5.8						134
AUG	16	194	5.3						12.0							72
SEPT	20	175	5.9	68	55				12.0	7.7						72
OCT	16	199	4.2	72	60				21.0	3.0						126
NOV	16	218	3.3	57	42				10.5	4.5						63
DEC	20	242	4.0	60	124				4.5	6.5						27
TOTAL	208	2341	-	-	-	-	-	-	140.0	-	-		-	-	-	838
AVG.	2.9 cu. ft/mil gal	195	3.3	53	51				11.7	4.9						70

WATER SUPPLY SYSTEM



PROJECT No. 6-0002-57

SOURCE

One well

TREATMENT

None

PUMPS

Type: Layne vertical turbine
Size: One 300 gpm (0.43 mgd)
Standby: none

STORAGE

One 115,000 gal steel standpipe

'73 Review

GENERAL

Operation of the Frankford Water Supply System was turned over to the Trenton Water Pollution Control Plant staff on June 6, 1972.

During the remainder of 1972, one watermain break was repaired and two new fire hydrants were installed, one on Mill Street and the other on North Trent Street. In 1973 an alarm system was installed and connected to the Frankford Water Pollution Control Plant alarm system. The alarm warns the plant staff whenever the watermain pressure drops below a predetermined level. All of the fire hydrants were painted, a new valve installed on Mill Street and another installed on James Street.

A new watermain and sewer were installed across the new Mill Street bridge by Looby Construction as part of the new Provincial water and sewage projects.

EXPENDITURES

The 1973 operating costs total \$5,711.17, slightly above the budgeted amount of \$4,675.

SYSTEM PERFORMANCE AND OPERATING DATA

Flows for the year totalled 47.9 million gallons. Average daily flows were 130,000 gallons per day, and have increased approximately 10,000 gallons per day every year since 1968.

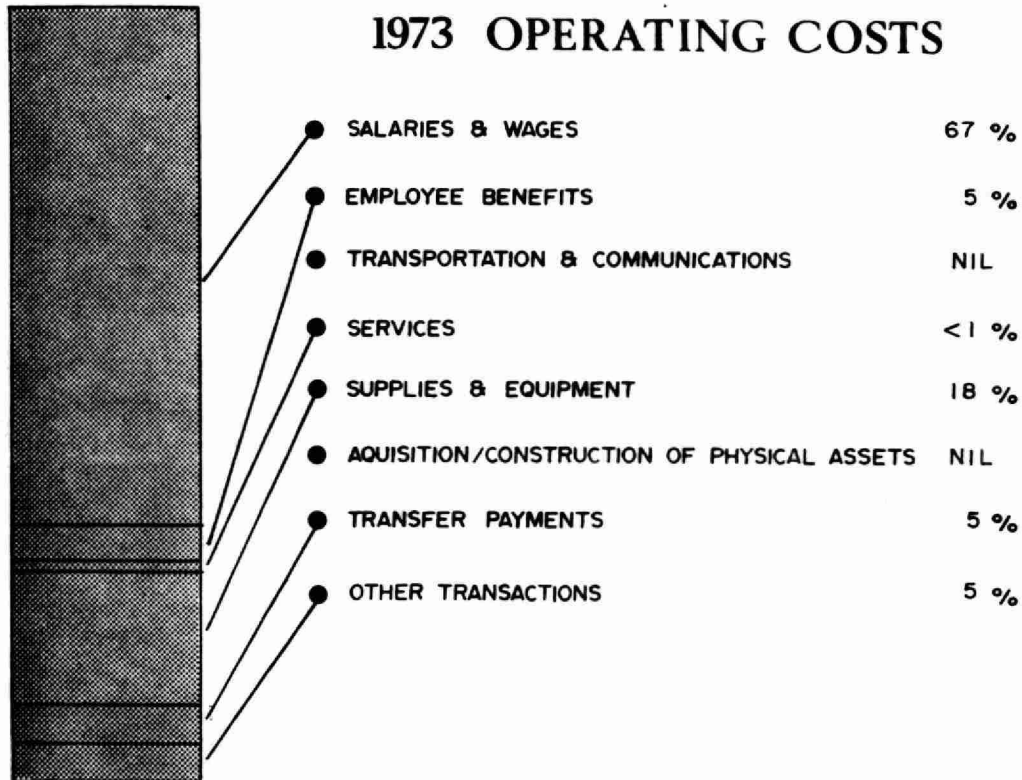
The well water quality has not changed over the past several years. The treated water has been excellent with only two samples of 128 taken from the plant effluent and distribution system showing any sign of incomplete disinfection.

CONCLUSIONS

The water system has been well maintained and conscientiously operated by the Trenton Water Pollution Control Plant staff.

ANNUAL COSTS

1973 OPERATING COSTS



YEARLY OPERATING COSTS

YEAR	WATER TREATED in million gallons	TOTAL OPERATING COSTS	UNIT COSTS cents per 1000 gal
1968	27.4	\$ 2,480	9
1969	32.6	3,252	10
1970	37.8	3,138	8
1971	44.5	9,272	13
1972	54.0	4,212	14
1973	47.9	5,711	12

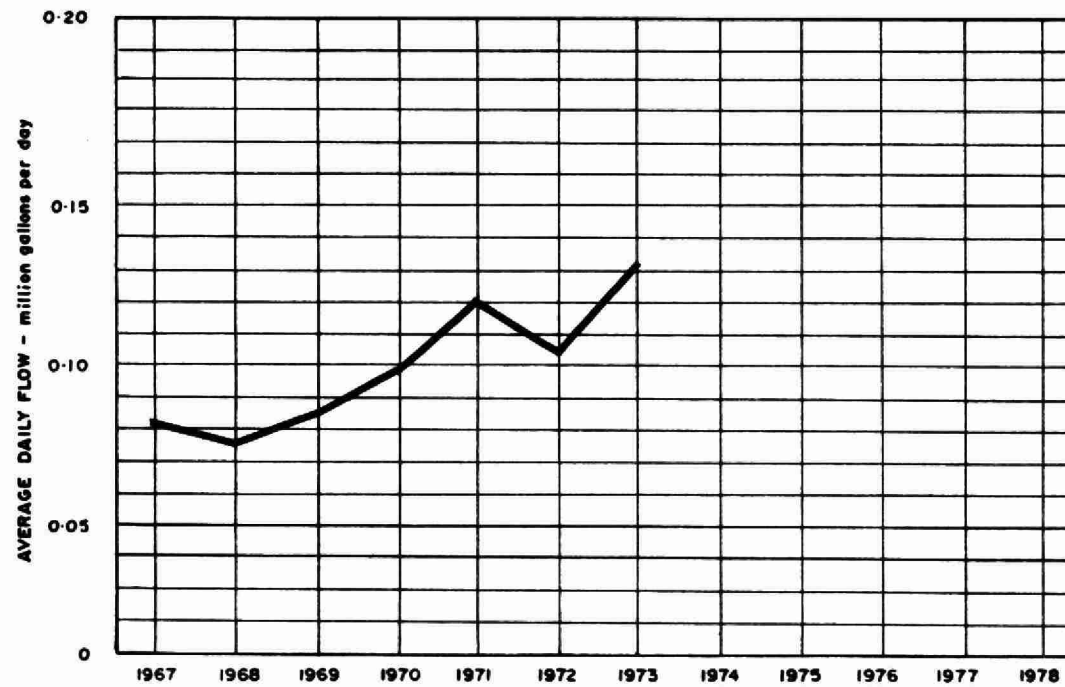
OPERATING EXPENDITURES

SALARIES AND WAGES	<u>\$ 3831</u>
EMPLOYEE BENEFITS	<u>290</u>
TRANSPORTATION & COMMUNICATIONS	<u>0</u>
SERVICES	<u>42</u>
SUPPLIES AND EQUIPMENT	<u>1020</u>
ACQUISITION/CONSTRUCTION OF PHYSICAL ASSETS	<u>0</u>
TRANSFER PAYMENTS	<u>268</u>
OTHER TRANSACTIONS	<u>260</u>
TOTAL	<u>\$ 5711</u>

PROCESS DATA

FLOWS

WATER



PLANT PERFORMANCE

MONTH	FLOWS			RAW WATER					PLANT EFFLUENT		DISTRIBUTION SYSTEM	
	TOTAL PLANT OUTPUT million gallons	AVERAGE DAILY FLOW million gallons	MAXIMUM DAY'S FLOW million gallons	NUMBER OF SAMPLES HAVING TOTAL COLIFORM ORGANISMS PER 100 ml OF					NUMBER OF SAMPLES TAKEN	NUMBER HAVING COLIFORM ORGANISMS	NUMBER OF SAMPLES TAKEN	NUMBER HAVING COLIFORM ORGANISMS
				0	1 - 3	4 - 32	33 - 320	> 320				
JAN	3.13	0.10	0.12						2	0	14	0
FEB	3.01	0.11	0.13						2	0	10	0
MAR	3.28	0.08	0.12						3	0	13	0
APR	3.15	0.10	0.13						4	0	12	0
MAY	3.24	0.10	0.14						3	0	13	0
JUNE	3.80	0.13	0.18						0	0	12	0
JULY	6.22	0.20	0.31						0	0	12	0
AUG	5.14	0.17	0.26						0	0	8	0
SEPT	4.54	0.15	0.28						0	0	0	0
OCT	3.92	0.13	0.18						0	0	12	0
NOV	4.40	0.15	0.25						1	1	6	1
DEC	4.07	0.13	0.17						0	0	1	0
TOTAL	47.90								15		113	
AVG.	3.99	0.13	MAXIMUM 0.31	(NOTE - Average shown is the GEOMETRIC MEAN)					1	0	9	0

WATER QUALITY

PROPERTY	RAW WATER				DESIRABLE STANDARDS
	NUMBER OF SAMPLES	AVERAGE	MAXIMUM	MINIMUM	
HARDNESS in mg/l as CaCO_3	2	284	288	280	80 - 100
ALKALINITY in mg/l as CaCO_3	2	245	246	245	30 - 100
IRON in mg/l Fe	2	< 0.05	< 0.05	< 0.05	Less than 0.3
CHLORIDE in mg/l Cl^-	2	12	12	11	Less than 250
pH in pH units	2	7.8	8.1	7.5	7.0 - 8.5
FLUORIDE in mg/l F^-					Less than 1.2

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